22. The semiconductor laser diode of claim 20, wherein the waveguide region has a doping level of no greater than 5 x $10^{16}/cm^3$.

23. The semiconductor laser diode of claim 20, wherein the materials of the waveguide region and the clad regions have a refractive index which provides confinement of the optical mode to the waveguide region with an overlap of the optical mode into the clad regions of no greater than 5%.

24. The semiconductor laser diode of claim 20, wherein the means for generating photons in the waveguide region includes at least one quantum well region.

25. The semiconductor laser diode of claim 20, wherein the means for generating photons in the waveguide region includes a plurality of spaced quantum well regions with a barrier region between each pair of adjacent quantum well regions.

26. The semiconductor laser diode of claim 20, wherein the clad regions are of a semiconductor material having a lower index of refraction than materials of portions of the waveguide region adjacent the clad regions.

27. The semiconductor laser diode of claim 24, wherein portions of the waveguide region on each side of the quantum well region are of a semiconductor material having a bandgap larger than that of the quantum well region.

28. The semiconductor laser diode of claim 24, wherein portions of the waveguide region on each side of the quantum well region each have an inner portion adjacent the quantum well region with a bandgap greater than the quantum well region and an outer portion adjacent the clad region with a bandgap greater than that of the inner portion.

29. The semiconductor laser diode of claim 20, wherein the thickness of the waveguide region and the composition of the waveguide and clad regions are such that an overlapping of the optical mode generated in the waveguide region into the clad regions is not greater than about 2%.

30. The semiconductor laser diode of claim 20, wherein the waveguide region has a length greater than about 2.0 mm.

31. The semiconductor laser diode of claim 20, wherein the waveguide region is of a thickness of about 0.7 μm.

32. The semiconductor laser diode of claim 20, wherein the waveguide region is of a thickness of about 1.3 μm.

33. The semiconductor laser diode of claim 24, wherein the quantum well region consists essentially of InGaAs.

34. The semiconductor laser diode of claim 20, wherein the waveguide region consists essentially of AlGaAs.

35. The semiconductor laser diode of claim 24, wherein the quantum well region consists essentially of InGaAsP.

36. The semiconductor laser diode of claim 20, wherein the waveguide region consists essentially of InGaAsP.

37. The semiconductor laser diode of claim 20, wherein the waveguide region comprises In and Ga.

38. A semiconductor laser diode comprising:

a body of a semiconductor material having therein a waveguide region comprising In and Ga, which is not intentionally doped and which substantially confines photons therein and allows the flow of photons therealong;

a quantum well within the waveguide region for generating an optical mode of photons; and

a clad region on each side of the waveguide region, the clad regions being at least partially doped to be of opposite conductivity type;

wherein said photon generating means is thinner than the thickness of the waveguide region and is spaced from the clad regions;

and wherein the thickness of the waveguide regions and the composition of the waveguide and clad regions are such that an overlapping of the optical mode generated in the waveguide region into the clad regions is not greater than about 5%.

39. The semiconductor laser diode of claim 38, wherein the quantum well region consists essentially of InGaAs.

40. The semiconductor laser diode of claim 38, wherein the waveguide region consists essentially of AlGaAs.

41. The semiconductor laser diode of claim 38, wherein the quantum well region consists essentially of InGaAsP.

42. The semiconductor laser diode of claim 38, wherein the waveguide region consists essentially of InGaAsP.

43. The semiconductor laser diode of claim 38, wherein the waveguide region is of a thickness of at least 500 nanometers.

44. The semiconductor laser diode of claim 38, wherein the waveguide region has a doping level of no greater than 5 x $10^{16}/cm^3$.

45. The semiconductor laser diode of claim 38, wherein the materials of the waveguide region and the clad regions have a refractive index which provides confinement of the optical mode to the waveguide region with an overlap of the optical mode into the clad regions of no greater than 5%.

46. The semiconductor laser diode of claim 38, further comprising a plurality of spaced quantum well regions within the waveguide region for generating an optical mode of photons with a barrier region between each pair of adjacent quantum well regions.

47. The semiconductor laser diode of claim 38, wherein the clad regions are of a semiconductor material having a lower index of refraction than the materials of portions of the waveguide region adjacent the clad regions.

48. The semiconductor laser diode of claim 38, wherein portions of the waveguide region on each side of the quantum well region are of a semiconductor material having a bandgap larger than that of the quantum well region.

49. The semiconductor laser diode of claim 38, wherein portions of the waveguide region on each side of the quantum well region each have an inner portion adjacent the quantum well region with a bandgap greater than the quantum well region and an outer portion adjacent the clad region with a bandgap greater than that of the inner portion.

50. The semiconductor laser diode of claim 38, wherein a portion of the waveguide region on each side of the quantum well region has a graded composition.

51. The semiconductor laser diode of claim 38, wherein a portion of the waveguide region on each side of the quantum well region has a uniform composition.

52. The semiconductor laser diode of claim 38, wherein the thickness of the waveguide region and the composition of the waveguide and clad regions are such that an overlapping of the optical mode generated in the waveguide region into the clad regions is not greater than about 2%.

53. The semiconductor laser diode of claim 38, wherein the waveguide region has a length greater than about 2.0 mm.

54. The semiconductor laser diode of claim 38, wherein the waveguide region has a thickness of about 0.7 μm.

55. The semiconductor laser diode of claim 38, wherein the waveguide region has a thickness of about 1.3 μm.